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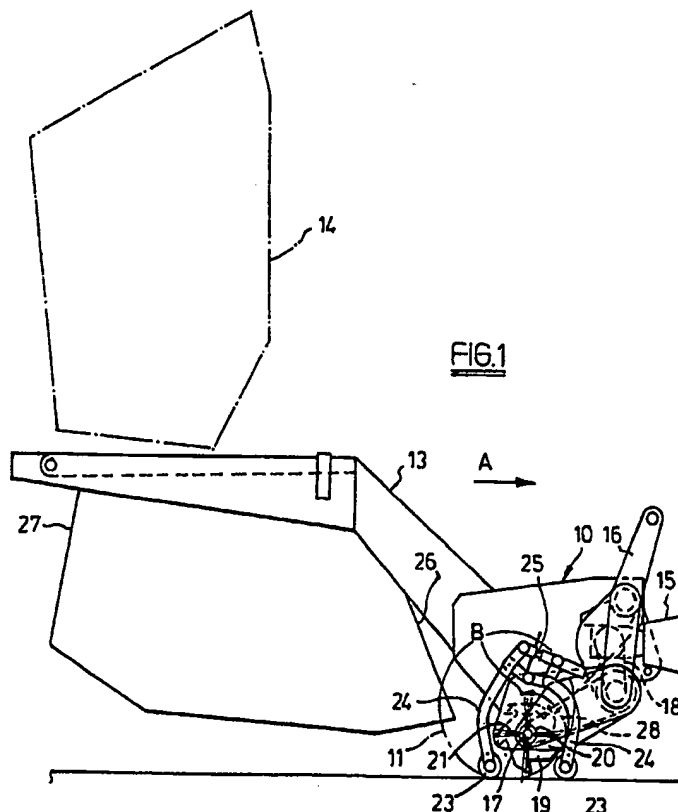
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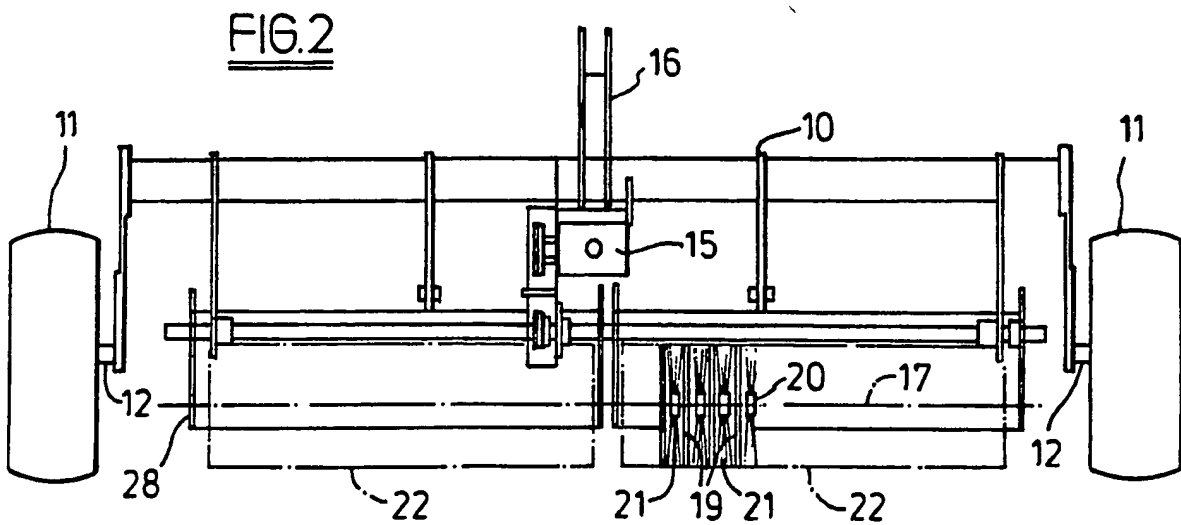
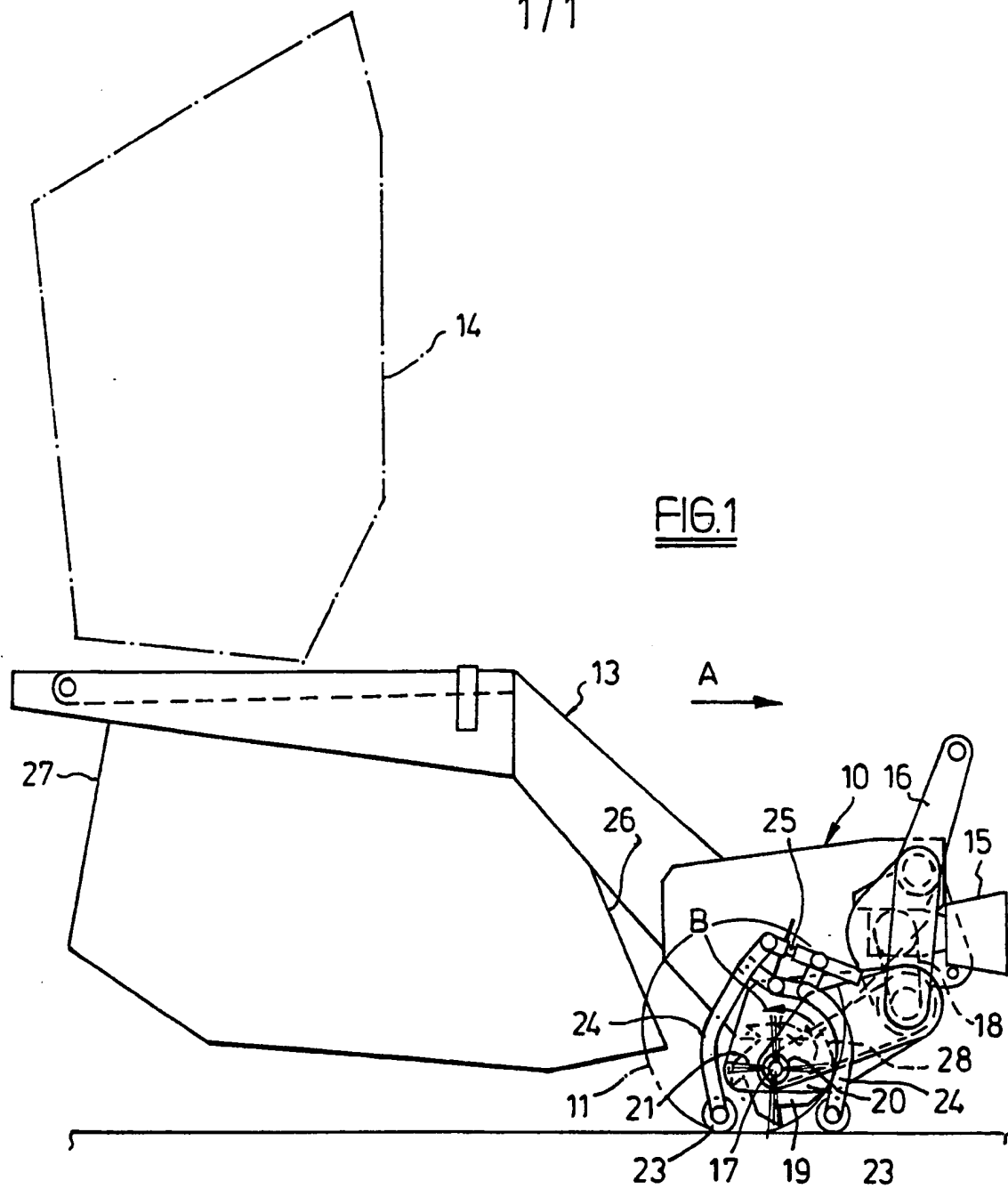
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## (54) Turf scarifying and sweeping apparatus

(57) A turf scarifying and sweeping apparatus comprising a supporting chassis (10) having a pair of ground-engaging wheels (11), and a driven transverse shaft (17) carrying longitudinally spaced scarifying blades (19) interposed by individual rotary brushes (21). The brushes are rotated in a direction opposite to an operational direction in which the apparatus travels over the ground thus to cause loose materials to be swept from the ground into a collection container (14) mounted on the chassis (10). A pair of adjustable rollers (23) determine the operational height of the blades (19) and brushes (21) in relation to the ground surface.





## TURF SCARIFYING AND SWEEPING APPARATUS

THIS INVENTION concerns turf scarifying and sweeping apparatus. Such apparatus which may be mounted on a wheeled chassis to be towed behind a tractor consists of a horizontally disposed driven shaft having longitudinally spaced scarifying blades or tines mounted thereon to scarify, for example, fine turf and outfield areas such as golf fairways. The apparatus typically also will include a collection hopper into which loose material is projected as a result of the scarifying action. Unfortunately, such apparatus may not, in all cases, satisfactorily sweep the loose material from the surface and project it upwardly into the hopper.

Therefore, an object of the present invention is to provide a turf scarifying and sweeping apparatus having an enhanced sweeping action.

According to the present invention, there is provided a turf scarifying and sweeping apparatus having a supporting framework and means by which it may be transported in one operational direction over a surface to be treated, a horizontally disposed shaft attached to the supporting framework and extending transversely of said operational direction, drive means for rotating the shaft, a plurality of scarifying members mounted in spaced relationship along the shaft, and a collection container; characterised by at least one brush rotatable with the shaft to sweep loose material from the surface into the collection container.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Fig. 1 is a partially cut away side elevation of apparatus made in accordance with the invention;

and Fig. 2 is a front elevation thereof.

In Fig. 1 there is illustrated a supporting framework or chassis generally indicated at 10 having a pair of ground engaging wheels 11 freely rotatable on axles 12 fixed to the chassis 10. Extending rearwardly behind the wheels 11 are a pair of transversely spaced supporting arms 13 to which is pivotally attached, to lie between them, a collection hopper 14 which is movable between positions illustrated by solid and chain dotted lines respectively in Fig. 1, to discharge the contents of the bin when required.

A power take-off device 15 is provided on the chassis 10 for connection to the rear of a tractor, also by means of a tractor hitch linkage 16.

Rotatably mounted near the bottom of the framework 10 is a shaft 17 driven by chains or belts 18 from the take-off device 15. Fixedly mounted on the shaft 17 are a plurality of scarifying blades 19 positioned along the shaft by means of spacer blocks 20. Rotary brushes 21 are disposed along the shaft 17 in alternate

locations between the blades 19, and each brush carries four sets of radial bristles spaced at 90° locations around one of the blocks 19 as can be seen in Fig. 1. The radial extent of the bristles is substantially equal to that of the scarifying blades 19. As illustrated by the dotted lines 22 in Fig. 2 the alternate series of scarifying blades and rotary brushes is spaced substantially across the width of the machine between the wheels 11.

A pair of ground engaging, height adjusting rollers 23 mounted on pivoted arms 24 are attached together by an adjustable rod 25 such that the rollers may be moved together or apart to adjust the operational height of the scarifying and sweeping assembly. An arcuate baffle 28 is mounted on chassis 10 immediately adjacent and in front of the assembly of blades 19 and brushes 21.

In operation, the apparatus is towed behind a tractor in the direction illustrated by arrow A, and the shaft 17 carrying the scarifying blades 19 and rotary brushes 21 is rotated in the direction illustrated by arrow B. As the apparatus proceeds over the ground the surface is scarified and swept simultaneously, and substantially all of the loose swept material is projected rearwardly into the open front 26 of hopper 14 for collection. When the hopper is full it can be pivoted upwardly to dispose of the contents through a removable panel (not shown) on its rear face 27.

The apparatus is therefore effective in leaving the surface scarified and free of loose material and provides the additional advantage of giving a "stripe effect" to the turf.

It is not intended to limit the invention to the above example only, many variations such as might readily occur to one skilled in the art, being possible without departing from the scope of the invention. For example, the bristles of the rotary brushes 21 may be arranged other than in four equidistant spaced bunches and may be distributed more evenly around the circumference. In a further alternative, the brush may be arranged in a helical form along the shaft 17 and divided to direct loose material towards the centre of the machine. Also, the scarifier blades may be replaced by rod-like tines.

The apparatus may be provided in a form which is manually operated that is to say progressed by hand in which case the collection hopper may be located ahead of the scarifying and sweeping apparatus in the direction of travel, and the driven shaft may be rotated in the opposite direction at a ground engaging speed greater than that of travel of the machine over the ground.

Still further, the brush or brushes may be mounted on a separate rotated shaft located behind the shaft 17 such that the bristles are close to or even overlap with the blades 19 thus to sweep the scarified ground.

The wheels 11 can be omitted and the entire apparatus attached to and suspended from the rear of a tractor.

## CLAIMS

1. A turf scarifying and sweeping apparatus having a supporting framework and means by which it may be transported in one operational direction over a surface to be treated, a horizontally disposed shaft attached to the supporting framework and extending transversely of said operational direction, drive means for rotating the shaft, a plurality of scarifying members mounted in spaced relationship along the shaft, and a collection container; characterised by at least one brush rotatable with the shaft to sweep loose material from the surface into the collection container.
2. A turf scarifying and sweeping apparatus according to Claim 1, wherein said at least one brush is comprised by a row of spaced brushes mounted in spaced relationship along the shaft, and alternately located on spacer blocks between the scarifying members.
3. A turf scarifying and sweeping apparatus according to Claim 2, wherein each said brush carries four sets of radially extending bristles the sets being spaced at 90° locations around the shaft.
4. A turf scarifying and sweeping apparatus according to Claim 3, wherein the radial extent of the bristles is substantially equal to that of the scarifying members.
5. A turf scarifying and sweeping apparatus according to any preceding claim, wherein each said scarifying member is a rotary

blade.

6. A turf scarifying and sweeping apparatus according to any one of Claims 2 to 4, wherein the row of scarifying members and brushes extends substantially across the entire width of the apparatus.

7. A turf scarifying and sweeping apparatus according to any preceding claim, including a power take-off device for connection to the rear of a tractor and drivingly connected to said shaft.

8. A turf scarifying and sweeping apparatus according to any preceding claim, wherein said collection container is pivotally mounted on the supporting framework adjacent to said shaft such that the container be tilted to discharge the contents thereof.

9. A turf scarifying and sweeping apparatus according to any preceding claim, including a pair of ground-engaging members and means to effect relative movement thereof to adjust the operational height of the scarifying members and said at least one brush.

10. A turf scarifying and sweeping apparatus according to any preceding claim, in which said at least one brush is arranged in a helical form along the shaft and divided to direct loose material towards the centre of the apparatus.

11. A turf scarifying and sweeping apparatus according to any preceding claim, including a pair of ground engaging wheels upon



which the supporting framework is transported.

12.           A turf scarifying and sweeping apparatus according to Claim 1, wherein said at least one brush is mounted on a separate rotatable shaft located adjacent the shaft carrying the scarifying members.

13.           A turf scarifying and sweeping apparatus substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

**Examiner's report to the Comptroller under Section 17  
(The Search report)**

Application number  
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**Relevant Technical Fields**

Search Examiner  
S WALLER

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(ii) Int Cl (Ed.5) A01B 43/00, 45/00, 45/02

Date of completion of Search  
1 JULY 1994

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-  
1-13

(ii) ONLINE DATABASES: WPI

**Categories of documents**

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|---|---|
| <b>X:</b> Document indicating lack of novelty or of inventive step.   | <b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.        |
| <b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category. | <b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| <b>A:</b> Document indicating technological background and/or state of the art.   | <b>&amp;:</b> Member of the same patent family; corresponding document.   |

Category	Identity of document and relevant passages	Relevant to claim(s)
P,X	GB 2268385 A (F P JUKES) see Figures 1A and 1B	1,11,12
X	EP 0267512 A1 (SEKO) see Figure 1	1,7,12

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).